WHAT IS CLAIMED IS:

1. An organic field effect transistor (OFET), comprising,

a substrate having a top surface; and

a semiconductor layer located over said top surface, said semiconductor layer comprising organic semiconductor molecules,

wherein each of said organic semiconductor molecules includes a core having conjugated pi bonds, a fluorinated alkyl group, and an alkyl spacer group having a chain of two or more carbon atoms,

wherein one end of said chain is bonded to said fluorinated alkyl group and another end of said chain is bonded to said core and substituents coupled to said carbon atoms have an electronegativity of less than about 4; and

wherein said OFET is configured to function as a p-type OFET.

2. The p-type OFET of claim 1, wherein said electronegativity is less than about 3.5.

3. The p-type OFET of claim 1, wherein said electronegativity is about 3 or more.

4. The p-type OFET of claim 1, wherein said chain has between 2 and 18 carbon atoms.

5. The p-type OFET of claim 1, wherein said core has ten or less aromatic rings.

6. The p-type OFET of claim 5, wherein said aromatic rings are thiophene rings.

7. The p-type OFET of claim 1, wherein each of said organic semiconductor molecules has a molecular weight of less than or equal to 2000 grams/mole.

8. The p-type OFET of claim 1, wherein said core has between ten and one-hundred aromatic rings and said fluorinated alkyl groups and said spacer groups are substituted on every or every other of said aromatic rings.

9. The p-type OFET of claim 1, further including source and drain electrodes on said top surface, wherein said source and drain electrodes comprise gold.

10. The p-type OFET of claim 9, wherein said substrate further including a gate electrode and a gate insulator interposed between said gate and said source and drain electrodes.

11. The p-type OFET of claim 10, wherein at least a portion of said semiconductor layer is interposed between said substrate and said source and drain electrodes.

12. The p-type OFET of claim 10, wherein at least a portion of said semiconductor layer covers said source electrode and said drain electrode.

13. The p-type OFET of claim 1, wherein a channel region in said semiconductor layer has a conductivity in an environment having a relative humidity of about 80 percent that is at least about 70 percent of the conductivity of said channel in a substantially zero-humidity environment.

14. A method of manufacturing an organic field effect transistor (OFET), comprising:

providing a substrate;

forming a gate over said substrate; and

forming a semiconductor layer over said substrate, wherein said semiconductor layer comprises organic semiconductor molecules,

wherein each of said organic semiconductor molecules includes a core having conjugated pi bonds, a fluorinated alkyl group, and an alkyl spacer group having a chain of two or more carbon atoms,

wherein one end of said chain is bonded to said fluorinated alkyl group and another end of said chain is bonded to said core and substituents coupled to said carbon atoms have an electronegativity of less than about 4; and

wherein said OFET is configured to function as a p-type OFET.

15. The method of Claim 14, further including forming source and drain electrodes over said gate, wherein said semiconductor layer is between said source and drain and at least a portion of said semiconductor layer is interposed between said source and drain electrodes and said substrate.

16. The method of Claim 14, wherein forming said gate further includes forming a gate electrode on said substrate and forming a gate insulator on said gate electrode.

17. The method of Claim 14, wherein forming said semiconductor layer includes vacuum sublimation of said organic semiconductor molecules on said substrate.

18. The method of Claim 14, wherein forming said semiconductor layer includes spin-coating or dip-coating said organic semiconductor molecules on said substrate.

19. The method of Claim 14, wherein said semiconductor layer is formed such that at least a portion of said channel is interposed between a source electrode and a drain electrode.

20. The method of Claim 19, wherein said channel is formed such that said semiconductor layer covers said source and drain electrodes.